Lecture #1: Tuesday, 6 January 2004
Topics: Selected References

References

The following books are useful references.

1. Alfred V. Aho, John E. Hopcroft, and Jeffrey D. Ullman. *The Design and Analysis of Computer Algorithms.* Addison-Wesley, 1974. The classic text, but it lacks topics in network flows and linear programming, as well as more recent algorithms. It is amazing that after more than twenty years it remains an extremely valuable book.

2. Alfred V. Aho, John E. Hopcroft, and Jeffrey D. Ullman. *Data Structures and Algorithms.* Addison-Wesley, 1983. Revised and more elementary version of the first six chapters of *The Design and Analysis of Computer Algorithms.*

3. Sara Baase. *Computer Algorithms: Introduction to Design and Analysis.* Second edition. Addison-Wesley, 1988. General reference, although the exposition is sometimes terse or sketchy.

4. Jon Bentley. *Programming Pearls.* Addison-Wesley, 1986. Applications of algorithm design techniques to software engineering.

5. Jon Bentley. *More Programming Pearls.* Addison-Wesley, 1988. More applications of algorithm design techniques to software engineering.

6. Jon Louis Bentley. *Writing Efficient Programs.* Prentice-Hall, 1982. Performance hacking extraordinaire.

7. Gilles Brassard and Paul Bratley. *Algorithmics: Theory and Practice.* Prentice-Hall, 1988. Good examples and problems. Focus on methods rather than specific problems.

8. Kai Lai Chung. *Elementary Probability Theory with Stochastic Processes.* Springer-Verlag, 1974. Intuitive introduction to probability.

9. Shimon Even. *Graph Algorithms.* Computer Science Press, 1979. Broad treatment of graph algorithms, including network flow and planarity.

10. William Feller. *An Introduction to Probability Theory and Its Applications.* John Wiley & Sons, 1968 (Volume 1), 1971 (Volume 2). Excellent reference for probability theory.

11. Michael R. Garey and David S. Johnson. *Computers and Intractibility: A Guide to the Theory of NP-Completeness.* W. H. Freeman & Co., San Francisco, 1979. Reference book devoted to NP-completeness. The second half contains an extensive list of NP-complete problems and references to algorithms in the literature for polynomial-time special cases.

12. G. H. Gonnet. *Handbook of Algorithms and Data Structures.* Addison-Wesley, 1984. Code in Pascal and C, comparisons of actual running times, and pointers to analysis in research papers.

13. Michael Goodridge and Roberto Tamassia. *Data Structures and Algorithms in JAVA.* Wiley, 1998. Elementary, but with nice Java code and applets.

14. Ellis Horowitz, Sartaj Sahni, and Sanguthevar Rajasekaran. *Computer Algorithms in C++.* Computer Science Press, 1997. Good on data structures, dynamic programming, as well as on branch-and-bound, randomized, and parallel algorithms.

15. Donald E. Knuth. *The Art of Computer Programming.* Addison-Wesley, 1968-1974. Encyclopedic work in three volumes: (1) Fundamental Algorithms, (2) Seminumerical Algorithms, and (3) Sorting and Searching. undoubtedly the greatest book ever written in Computer Science.

16. Donald E. Knuth. *The Stanford GraphBase.* Addison-Wesley, 1993. A collection of data and actual C programs implementing a variety of graph and related algorithms. Excellent accompaniment to the CLR course text.

17. Eugene L. Lawler. *Combinatorial Optimization.* Holt, Rinehart, and Winston, 1976. Graph algorithms (dense graphs), network flows, and linear programming. First few chapters are excellent.

18. C. L. Liu. *Introduction to Combinatorial Mathematics.* McGraw-Hill, 1968. Combinatorial mathematics relevant to computer science. Excellent problems.

19. Udi Manber. *Introduction to Algorithms.* Addison-Wesley, 1989. Elementary text with an emphasis on creativity.

20. Kurt Mehlhorn. *Data Structures and Algorithms.* Springer-Verlag, 1984. Three volumes: (1) Sorting and Searching, (2) Graph Algorithms and NP-Completeness, and (3) Multi-dimensional Searching and Computational Geometry. Lecture notes on basic and advanced topics.

21. Ivan Niven and Herbert S. Zuckerman. *An Introduction to the Theory of Numbers.* John Wiley & Sons, 1980. Readable introduction to number theory.

22. Christos H. Papadimitriou and Kenneth Steiglitz. *Combinatorial Optimization: Algorithms and Complexity.* Prentice-Hall, 1982. Linear programming and its variants.

23. James Pitman. *Probability.* Springer-Verlag, 1993. An excellent elementary introduction to probability theory, as needed in this course.

24. William P. Press, Brian P. Flannery, Saul A. Teukolsky, and William T. Vetterling. *Numerical Recipes in C: The Art of Scientific Computing,* Cambridge University Press, Cambridge, 1988. Code for numerical algorithms.

25. E. M. Reingold, J. Nievergelt, and N. Deo. *Combinatorial Algorithms: Theory and Practice.* Prentice-Hall, 1977. Good on recurrence relations and binary search trees.

26. Robert Sedgewick. *Algorithms.* Second edition. Addison-Wesley, 1988. Elementary text with an excellent breadth of topics. Lighter on analysis than CLR, but lots of figures. Newer versions exist with example code in a variety of current languages (C, C++, Modula II).

27. Robert Sedgewick. *Algorithms in C, Parts 1-4.* Third edition. Addison-Wesley, 1998. A much revised version of the above. A C++ version is also available.

28. Robert Endre Tarjan. *Data Structures and Network Algorithms.* Society for Industrial and Applied Mathematics, 1983. Advanced book with tons of good stuff.